CLAIMS

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1. A power transformer/reactor comprising at least one winding, **characterized** in that the winding/windings comprise one or more current-carrying conductor, that around each conductor (4) there is arranged a first layer (6) with semiconducting properties, that around the first layer there is arranged a solid insulating part (7), and that around the insulating part there is arranged a second layer (8) with semiconducting properties.

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2. A power transformer/reactor according to claim 1, ~~characterized in that~~ wherein the first layer (6) is at substantially the same potential as the conductor.

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3. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the second layer (8) is arranged in such a way that it essentially constitutes an equipotential surface surrounding the conductor/conductors.

4. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the second layer (8) is connected to earth potential.

5. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the semiconducting layers (6,8) and the insulating part (7) have substantially the same coefficient of thermal expansion such that, upon a thermal movement in the winding, defects, cracks or the like do not arise in the boundary layer between the semiconducting layers and the insulating part.

6. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that each of the semiconducting layer (6,8) is secured to the adjacent solid

insulating part (7) along essentially the whole adjoining surface.

7. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the winding/windings is/are designed in the form of a flexible cable.

8. A power transformer/reactor according to claim 7, **characterized** in that the cable is manufactured with a conductor area which is between 30 and 3000 mm^2 and with an outer cable diameter which is between 20 and 250 mm.

9. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the solid insulation (7) are formed by polymeric materials.

10. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the first layer (6) and/or the second layer (8) are formed by polymeric materials.

11. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the solid insulation (7) has been obtained by extrusion.

12. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the current-carrying conductor (4) comprises a number of strands, said strands being insulated from each other except a few strands that are uninsulated in order to secure electric contact with the first semiconducting layer (6).

13. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that at least one of the strands of the conductor (4) is uninsulated and arranged

in such a way that electrical contact is achieved with the inner semiconducting layer.

14. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the power transformer/reactor comprises a core consisting of magnetic material.

15. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the power transformer/reactor comprises an iron core consisting of core limbs and yokes.

16. A power transformer/reactor according to claim 1-13, **characterized** in that the power transformer/reactor is formed without an iron core (air-wound).

17. A power transformer/reactor comprising at least two galvanically separated windings according to any preceding claim, **characterized** in that the windings are concentrically wound.

18. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the power transformer/reactor is connected to two or more voltage levels.

19. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the terminals of the high and/or low-voltage winding are jointed to a power cable and/or made similar to power cable termination(s).

20. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that substantially all of the electrical insulation in the transformer/reactor is enclosed between the conductor (4) the second layer (8) of

the windings and which insulation is in the form of solid insulation.

21. A power transformer/reactor according to one or more of the preceding claims, **characterized** in that the winding thereof is designed for high voltage, suitably in excess of 10 kV, in particular in excess of 36 kV, and preferably more than 72,5 kV and up to very high transmission voltages, such as 400 kV to 800 kV or higher.

22. A power transformer/reactor according to one or more of the preceding claims, **characterized** in the transformer/reactor is designed for a power range in excess of 0.5 MVA, preferably in excess of 30 MVA.

23. The cooling of a power transformer/reactor according to one or more of the preceding claims, **characterized** in that the power transformer/reactor is cooled with liquid and/or gas on earth potential.

24. A method for electric field control in a power transformer/reactor comprising a magnetic field generating circuit having at least one winding with at least one electrical conductor and an insulation present externally thereof, **characterized** in that the insulation is formed by a solid insulation material and that an outer layer is provided externally of the insulation, said outer layer being connected to ground or otherwise a relatively low potential and having an electrical conductivity being higher than the conductivity of the insulation but lower than the conductivity of the electrical conductor so as to function for equalization of potential and cause the electrical field to be substantially enclosed in the winding internally of the outer layer

25. A method in production of a power transformer/reactor according to one ore more of the preceding claims,

characterized in that a flexible cable is used as a winding and that the winding of the cable to form the winding/windings of the transformer/reactor is assembled on-site.

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